Bartelkeite $PbFeGe^{VI}(Ge_2{}^{IV}O_7)(OH)_2 \cdot H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Crystals, to 1 mm, tabular on {101} or acicular on {101}; {111} and {010} also observed.

Physical Properties: *Cleavage:* {101}, distinct. Hardness = ~ 4 D(meas.) = n.d. D(calc.) = 5.36

Optical Properties: Transparent. *Color*: Colorless, white to very pale greenish. *Streak*: White. *Luster*: Subadamantine.
Optical Class: Biaxial (–). α = 1.885(4) β = 1.910(4) γ = 1.913(4) 2V(meas.) = ~ 35(5)°
Orientation: $Z = b$; $X \wedge a \approx 55°$. *Dispersion*: $r < v$.

Cell Data: *Space Group: P*$2_1/m$. a = 5.8279(2) b = 13.6150(4) c = 6.3097(2) β = 127.314(2)° Z = 2

X-ray Powder Pattern: Tsumeb, Namibia.
2.91 (10), 4.42 (8), 2.87 (8), 2.75 (7), 2.20 (7), 4.74 (6), 5.08 (5)

Chemistry:	(1)
PbO	34.1
FeO	10.6
GeO_2	46.2
As_2O_5	2.8
SiO_2	0.10
ZnO	0.08
P_2O_5	0.04
Cl	0.20
SO_3	0.14
H_2O	[5.64]
Total	99.90

(1) Tsumeb, Namibia; average of 18 electron microprobe analyses supplemented by Raman spectroscopy, H_2O calculated for charge balance; corresponding to $Pb_{0.97}(Fe^{2+}_{0.94}Zn_{0.01})_{\Sigma=0.95}Ge^{VI}_{1.00}(Ge_{1.81}As_{0.16}Si_{0.01}S_{0.01})^{IV}_{\Sigma=1.99}O_7[(OH)_{1.94}Cl_{0.04}]_{\Sigma=1.98} \cdot 1.02H_2O$.

Occurrence: A very rare mineral in cavities in oxidized primary germanium ore from a dolostone-hosted hydrothermal polymetallic ore deposit.

Association: Germanite, reniérite, tennantite, galena.

Distribution: From Tsumeb, Namibia.

Name: Honors Wolfgang Bartelke (b. 1949), German mineral collector and specialist in the minerals of Tsumeb, Namibia.

Type Material: University of Stuttgart, Stuttgart, Germany (NM07); National Museum of Natural History, Washington, D.C., USA (148302).

References: (1) Keller, P., H. Hess, and P.J. Dunn (1981) Bartelkeit, $PbFe^{2+}Ge_3O_8$, ein neues Germanium Mineral von Tsumeb, Namibia. Chem. Erde, 40, 201-206 (in German with English abs.). (2) (1982) Amer. Mineral., 67, 413 (abs. ref. 1). (3) Origlieri, M.J., Hexiong Yang, R.T. Downs, E.S. Posner, K.J. Domanik, and W.W. Pinch (2012) The crystal structure of bartelkeite, with a revised chemical formula, $PbFeGe^{VI}(Ge_2{}^{IV}O_7)(OH)_2 \cdot H_2O$, isotypic with high-pressure $P2_1/m$ lawsonite. Amer. Mineral., 97, 1812-1815.